ation of the arrangement by which the palæontologists were enabled to accompany the party—a very proper plan, and one which in this case greatly facilitated the speed and exactness of correlation and mapping, besides accumulating material for an important monograph on the fossils.

The report contains two geological maps and several views of the scenery. An appendix on the reported ore deposits of the Wichita Mountains, by Mr. H. Foster Bain, should be of use as a warning to prospectors.

(3) Henceforth let no man say there is coal in Perry. For seventy years have the dwellers in south-eastern Maine cherished the hope that coal lay within their borders; and had they not good reason? Perry lies near the edge of a structural basin, and they had been told that the "Perry" beds were Triassic, consequently that coal might be found beneath them; the Canadian Geological Survey had coloured the beds Carboniferous on their map—in spite of Sir William Dawson's diagnosis of the plants—and mining "experts," glancing at the same obscure plant remains, had said, "Here you are, the very thing," and had gladly bidden the people to bore; and they bored, through the Perry beds into the Silurian lavas, but into no coal. Still in hope, the sum of 15,000 dollars was asked for to put down more bore-holes; it was decided, however, first to call in the aid of the U.S. Geological Survey Department, with the result that Messrs. Smith and White were sent to examine the ground. Then, hey presto! the obscurity vanished—a ten days' reconnaissance was enough. There is no coal in the Perry beds, only conglomerate with a little sandstone and shale and interstratified basic lava. Subsequent examination of the badly preserved plants confirmed the age of the beds to be Devonian, probably Chemung, and, incidentally, produced two new generic types. The plants are figured in six plates. J. A. H.

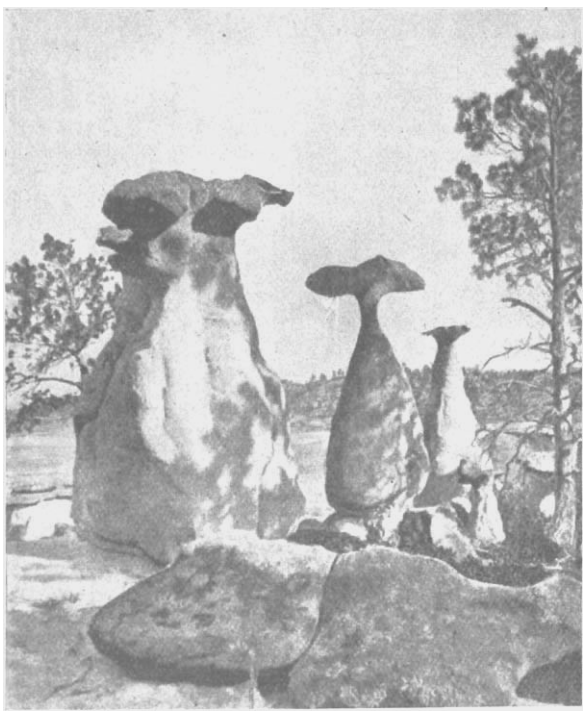

FIG. 2.—Eroded Sandstones, Monument Park, Colorado.

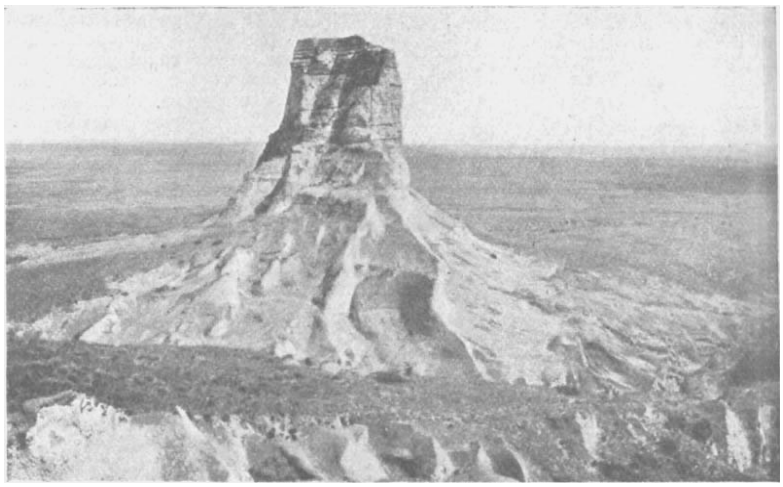

FIG. 3.—"Jail Rock," showing castellated form of weathering of Gering sandstone and slopes of Brule clay; valley of North Platte in the distance.

STUDIES OF TEMPERATURE AND PRESSURE OBSERVATIONS.

METEOROLOGISTS will be interested in a paper recently published by Dr. van Rijckevorsel, and entitled "Konstant auftretende secundäre Maxima und Minima in dem jährlichen Verlauf der meteorologischen Erscheinungen," part ii. (Rotterdam: Van Hengel, 1905). This is really the second portion of a previous publication, only in this instance the number of stations dealt with is more numerous, and the stations themselves more generally distributed over the earth's surface.

By the method explained in the pamphlet the author has obtained for twenty-two stations the mean annual temperature variations, the resulting curve representing the mean of observations of altogether 3636 years. The author then proceeds to eliminate the annual period of twelve months, and also discusses the residuals. The main result at which he arrives is that, no matter whether he deals with all the observations collectively, with the European stations alone, or with stations collected in north or south hemispheres, there is over the whole earth's surface during twelve months a half-yearly period of temperature the epochs of which are identical. It shows maxima in the beginning of March and September, and two minima in the first days of June and December. Another oscillation which is referred to is one composed of a series of very small maxima and minima.

With regard, however, to the six-monthly oscillation of temperature, a variation which seems to be clearly marked, it is interesting to note that the epochs of maxima seem to pick out the times when the north and south poles of the sun are consecutively turned towards the earth.

As the author finds that stations representing the north and south hemispheres give practically identical results, it would be interesting if he would try an east and west system of grouping of stations, and see if the same result is obtained. In the light of recent work, it seems quite possible, but not probable, that if stations in North-West Africa, South and North America, Honolulu, and Siberia be formed into one group, and the rest of the world into another, the same variation, but of opposite or nearly opposite phase, might be the result. The attempt is well worth trying, since the author has all the material at his hand, and the more stations employed in South America to counterbalance the larger number used and more easily obtained in the European area the better. In this pamphlet curves are given showing the variations derived, and

numerous tables containing the data for stations which possess observations extending more or less continuously over fifty years or more.

In a recent number of the *Meteorologische Zeitschrift* (January) Prof. Hofrat Hann has contributed a new determination of the mean temperature of the earth's atmosphere. In the second edition of his classical "Lehrbuch der Meteorologie," recently noted in this Journal, he gave us the results of a discussion of the material then available, but the publication of more data by Prof. Mohn dealing with the air temperature in the region of the North Pole renders a slight modification of the mean values necessary.

Prof. Mohn has just completed a study of the meteorological observations made during Nansen's memorable North Polar expedition in 1893–6, and has been able to make a new determination of the mean temperatures of the air for the parallels of latitude 60° to 90° north. These new values have enabled Prof. Hann to re-calculate afresh the mean temperature of the whole northern hemisphere, using the results obtained in the investigation of Spitaler for the parallels from 0° to 55° N. The value obtained for the mean of the northern hemisphere was finally 15°·1 C. For the southern hemisphere Prof. Hann had previously determined the value to be 13°·6 C., so that the mean value for the whole earth comes out as 14°·35 C. It is interesting to remark that the northern hemisphere appears to be 1°·5 C. warmer than the southern. Spitaler in 1886 came to a similar conclusion, his figures being :—

Northern hemisphere	15°·4 C.
Southern hemisphere	14°·8 ,,
Whole earth	15°·1 ,,
Excess of N. over S.	0°·6 ,,

Prof. Hann points out that the meteorological observations made during the recent Antarctic expeditions will be of special interest in relation to this question, since a new and better determination of the value for the southern hemisphere is rendered possible.

Attention is directed to the investigation of Prof. Supan, who formed the mean air temperatures into two groups, namely, east and west hemispheres, the dividing lines being 20° W. and 160° E. In this case the eastern hemisphere appears to be the warmer, as can be judged from the following mean temperatures calculated by Prof. Hann :—

	Hemisphere	
	West	East
North Pole to equator ...	14°·6 C. ...	15°·6 C.
North Pole to 30° N. ...	5°·0 ,, ...	5°·4 ,,
30° N. to equator	24°·1 ,, ...	25°·8 ,,
Equator to 30° S.	23°·1 ,, ...	23°·6 ,,
Equator to 50° S.	19°·6 ,, ...	19°·4 ,,

It is only when more southern latitudes are included in the regions investigated that the resulting values give an excess of temperature for the western hemisphere.

In the northern hemisphere the land exceeds the water surface, while the opposite is the case in the southern hemisphere. The figures given above for these districts indicate, therefore, that the land has a capacity for raising the mean temperature of the air, the temperature of the northern in excess of the southern hemisphere being 1°·5 C.

According to General Tilto, there is a greater proportion of land to water in the eastern than in the western hemisphere, the values being

	Per cent. land	Per cent. water
Western Hemisphere (80° N. to 70° S.) ...	17 ...	83
Eastern ,, ,, ,, ...	37 ...	63

From this, therefore, the eastern hemisphere should be warmer than the western. The above figures show that this is actually the case, thus corroborating the deductions made for the relative temperatures of the north and south hemispheres.

In an article which appeared in these columns in 1904 (vol. lxx., p. 177) entitled "A World-wide Barometric See-saw," an account was given of the results of a study by Sir Norman Lockyer and myself of barometric changes of short period, which brought to light the existence of two large regions on the earth's surface, antipodal to one another, which behaved in an inverse manner to each other. In this article a chart was given illustrating the distribution of the different types of pressure variation, and it was pointed out that the further any station was placed from the centres of the two main regions, namely, India and Cordoba, the less the barometric variations were like those of these two regions.

In a recent paper by Dr. Wilhelm Krebs, of Grossflottbek, entitled "Barometrische Ausgleichsbewegung in der Erdatmosphäre" (*Das Weltall*, Jahrgang 6, Heft 8, p. 118), the distribution of this short-period barometric change is discussed, and the author constructs an isophase chart from some of the data published in the original communication from which the above-mentioned article was an abstract.

The method adopted by Dr. Krebs is to call the Indian (Bombay) barometric change 100 per cent., and determine the percentage of the changes in relation to India at nineteen other stations distributed over the earth's surface. This procedure is really not valid, because there are two stations, namely, Bombay and Cordoba, which should both be taken as 100 per cent. each, the one positive and the other negative. Calling Bombay 100 per cent., Dr. Krebs deduces Cordoba as 31 per cent.! Since the Cordoba pressure change is the inverse of that of Bombay, it is difficult to see how the 31 per cent. is obtained. Further, the chart becomes very misleading, for the isophase lines connect up places which have a totally different short-period barometric variation. Thus, for instance, his 70 per cent. line passes through Norway and Sweden, European Russia, Arabia, the Indian Ocean, and Australia. The pressure changes in the latter three regions are closely similar, but all very different from those existing in the first three regions named.

As a matter of fact, the chart already referred to as published previously in this Journal was really an isophase map. In it each of the different signs there adopted, namely, +, +?, −, −?, &c., represented types of barometric changes, the + signs, for instance, representing all places which behaved like India, and therefore represented as 100 per cent. according to Dr. Krebs's method. A more minute differentiation than this seems at present impossible until a much larger number of stations are employed in the survey.

WILLIAM J. S. LOCKYER.

THE MINERAL WEALTH OF ALASKA.

RECENT developments have shown that Alaska as a mining field stands in the front rank among the possessions of the United States. Its annual gold production represents a value of some 1,600,000*l*. It produces silver, copper, and coal in considerable quantities, and its recently discovered tin and petroleum deposits are of great promise. During the past year the investigation of the mineral resources of Alaska has been energetically carried on by the United States Geological Survey under adverse conditions, and the Bulletins (Nos. 259, 250, and 236) recently published by Mr. A. H. Brooks, Mr. G. C. Martin, and Mr. C. W. Wright afford striking evidence of the excellent work that is being done in this direction by officers of the survey. Attention has naturally been directed chiefly to the gold placers. The placers of the Seward Peninsula, a field embracing an area of 20,000 square miles, still hold the first place in gold production in Alaska. Seven distinct types of alluvial gold deposits are met with in Alaska:—

(1) Creek placers, at the level of small streams.

(2) Hillside placers, on slopes.

(3) Bench placers, in ancient stream deposits 50 feet to 300 feet above present streams.

(4) Gravel-plain placers, in the coastal plain of Seward Peninsula.

(5) Sea-beach placers, on shore to which waves have access.

(6) Lake-bed placers, in beds of present or ancient lakes.

(7) River-bar placers, on gravel flats near the beds of large streams.

The mining of placer gold in Alaska is carried on during June, July, August, and September; and mining operations are rendered difficult not only by the short available season, but also by the lack of fall in the streams, the poor supply